Cyclone BFC

Condensing Glass-Lined Water Heater

BFC - 28/30/50/60/80/100

Meets EPC standards

Fully room-sealed condensing high-efficiency water heater (95%gross) • Flexible flue options (maximum length 115 m) allows installation almost anywhere • ThermoControl for easy flexible control/fault diagnosis • Meets latest EPC standards: Cyclone BFC 28-60: 0.902 • Utilises premix Low-NOx burner BFC 80/100 • Patented Cyclone burner BFC28-60 • All models suitable for natural or LP gas • Programmable for legionella purge cycle • Scale formation is reduced through the improved design and location of the heat exchanger • Cyclone BFC 80/100: comes as standard with powered anodes to reduce maintenance requirements • Remote control connection • Voltage-free contact for general fault indication • Optional ancillaries: Unvented kits • Destratification pump kit • Powered anodes

Innovation has a name.

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Technical specifications

		BFC 28	BFC 30	BFC 50	BFC 60	BFC 80	BFC 100
Gas data natural gas 2H (G20)							
Input*	kW	32.1	34.5	52.6	63.2	86.6	105.5
Output	kW	30.5	32.7	48.8	59.6	81.9	99.8
Inlet pressure	mbar	20	20	20	20	20	20
Burner pressure	mbar	8.5	8.5	8.5	11.5	7.0	6.0
Gas consumption**	m^3/h	3.1	3.3	5.0	6.0	8.3	10.1
Diameter main orifice	mm	4.90	5.10	7.00	7.10	6.30	6.80
Max. flue gas temperature	°C	70	50	75	75	50	50
Flue gas discharge	kg/h	56.8	61.1	85.4	101.4	141.9	164.3
Gas data butane 3+ (G30)							
Input*	kW	30.7	32.8	50.6	59.4	-	-
Output	kW	29.8	31.8	48.1	57.4	-	-
Inlet pressure	mbar	30	30	30	30	-	-
Burner pressure	mbar	30	30	30	30	-	-
Gas consumption**	kg/h	2.2	2.4	3.7	4.3	-	-
Diameter main orifice	mm	2.50	2.60	3.40	3.80	-	-
Max. flue gas temperature	°C	70	50	75	75	-	-
Flue gas discharge	kg/h	60.0	62.2	86.0	101.9	-	-
Gas data propane 3+ (G31)							
Input*	kW	29.0	30.9	50.3	59.1	84.8***	103.3***
Output	kW	28.1	29.8	47.7	56.9	81.9***	99.8***
Inlet pressure	mbar	37	37	37	37	37***	37***
Burner pressure	mbar	37	37	37	37	13.0***	13.0***
Gas consumption**	kg/h	2.1	2.2	3.6	4.2	6.1***	7.4***
Diameter main orifice	mm	2.50	2.60	3.40	3.80	4.70***	5.10***
Max. flue gas temperature	°C	70	50	75	75	50***	50***
Flue gas discharge	kg/h	54.3	56.5	85.1	101.0	142.1***	176.4***
Draw-off capacity							
Storage capacity	l	217	368	368	368	460	460
Max. temperature setting	°C	80	80	80	80	80	80
T_{cold} = 10°C / T_{set} = 70°C							
30 min. ΔT=44°C	l	505	689	831	925	1222	1379
60 min. ΔT=44°C	l	802	1008	1308	1507	2023	2354
90 min. ΔT=44°C	l	1100	1327	1785	2089	2823	3329
120 min. ΔT=44°C	l	1398	1646	2262	2671	3623	4304
Continuous ΔT=44°C	l/h	595	638	954	1164	1601	1950
Heating-up time ΔT=44°C	min.	22	35	23	19	17	14
30 min. ΔT=50°C	l	444	606	731	814	1076	1214
60 min. ΔT=50°C	l	707	887	1151	1326	1780	2072
90 min. ΔT=50°C	l	968	1168	1571	1839	2484	2929
120 min. ΔT=50°C	l	1230	1449	1991	2351	3189	3787
Continuous ΔT=50°C	l/h	524	562	840	1024	1409	1716
Heating-up time ΔT=50°C	min.	25	39	26	22	20	16
30 min. ΔT=55°C	l	404	551	665	740	978	1109
60 min. ΔT=55°C	l	642	806	1046	1206	1618	1883
90 min. ΔT=55°C	l	880	1062	1418	1671	2258	2663
120 min. ΔT=55°C	l	1118	1317	1810	2137	2899	3443
Continuous ΔT=55°C	l/h	476	511	763	931	1281	1560
Heating-up time ΔT=55°C	min.	27	43	29	24	22	18
Electrical data							
Power consumption	W	275	275	275	275	625	710
Power supply	VAC/Hz	230 (-15/+10%). 50 (+/-1Hz)					
General							
Fan rotational speed at ignition	r.p.m.	4500	4500	4500	4500	2790	3120
Working speed of fan	r.p.m.	5000	5400	6000	6660	5100	5700
Pressure differential	Pa	635/605	855/825	885/855	1085/1055	1005/975	1145/1115
Diameter of air restrictor	mm	23	23	28	29	36	38
Anodes	-	4	4	4	4	2	2
Maximum working pressure	bar	8					
Shipping data							
Weight empty	kg	177	214	214	214	480	480
Maximum weight	kg	394	582	582	582	940	940
Weight incl. packaging	kg	197	234	234	234	491	491
Width packaging	mm	790	790	790	790	920	920
Height packaging	mm	1550	2080	2080	2080	2060	2060
Depth packaging	mm	950	950	950	950	1020	1020

*** 3P (G31)

* Gas data on gross value
** Gas consumption at 15°C and 1013.25 mbar

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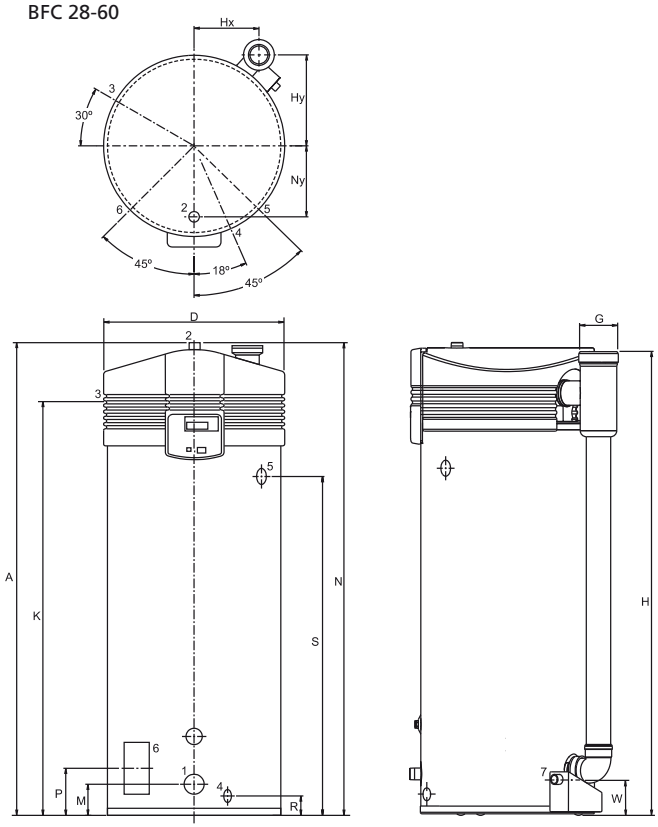
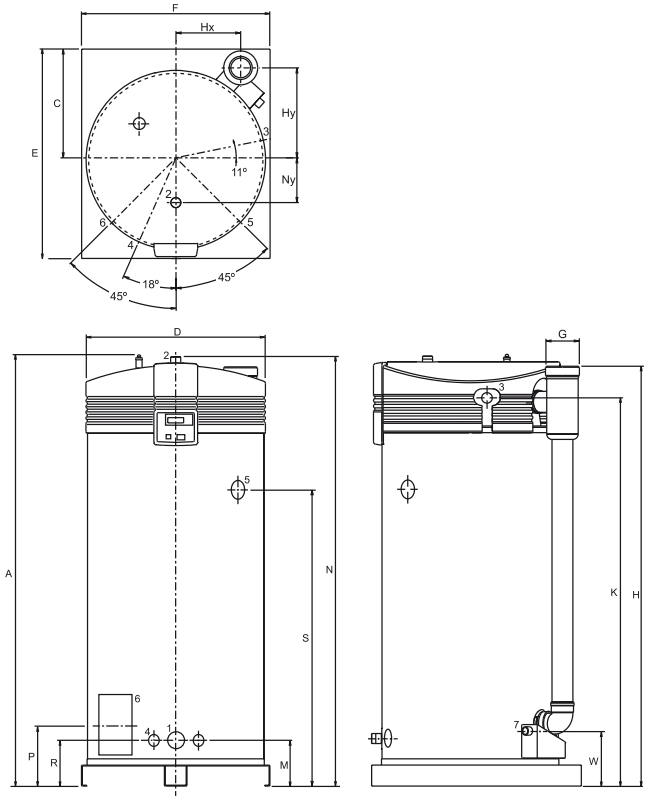
Cyclone BFC

Dimensions

BFC 28-60



BFC 80-100



	BFC 28	BFC 30	BFC 50	BFC 60	BFC 80	BFC 100
A	1390	1910	1910	1910	2060	2060
C	-	-	-	-	530	530
D	705	705	705	705	850	850
E	-	-	-	-	1000	1000
F	-	-	-	-	900	900
G	80/125	100/150	100/150	100/150	130/200	130/200
H	1365	1905	1905	1905	2015	2015
Hx	265	265	265	265	310	310
Hy	375	375	375	375	440	440
K	1270	1800	1800	1800	1855	1855
M	170	160	160	160	225	225
N	1390	1910	1910	1910	2060	2060
Ny	205	205	205	205	205	205
P	170	175	175	175	290	290
R	85	75	75	75	225	225
S	900	1410	1410	1410	1425	1425
W	125	145	145	145	240	240

1	Cold water (external)	R1 1/2
2	Hot water (external)	R1 1/2
3	Gas control (internal)	Rp 3/4
4	Tank drain valve (internal)	3/4
5	T&P valve (internal)	1-11.5 NPT
6	Cleaning and inspection opening	95x70
7	Condensation drainage (internal)	Ø40 (BFC 28) Rp 1 (BFC 30-100)

Dimensions in mm. All Cyclone BFC water heaters receive a three years warranty on the tank and one year on parts.

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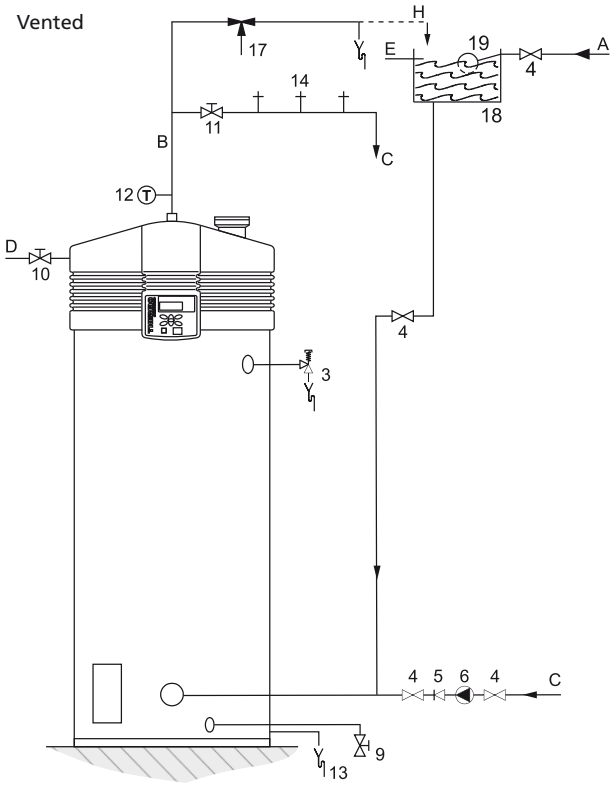
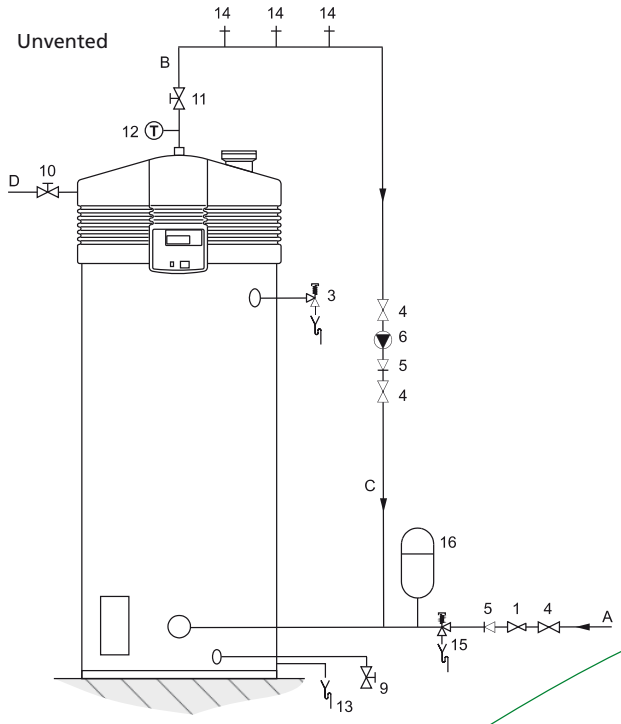
Installation diagrams





1 Pressure reducing valve
3 T&P valve
4 Stop valve
5 Non-return valve
6 Circulation pump
9 Drain valve
10 Gas cock
11 Isolating valve
12 Temperature gauge
13 Condense drain
14 Hot water outlets
15 Expansion relief valve
16 Expansion vessel
17 Three way valve
18 Water tank
19 Float valve

A Cold water
B Hot water
C Return circulation
D Gas supply
E Overflow pipe
H Expansion vent pipe

A.O. Smith unvented system kits utilise combination valves.

Further installation and connection details can be found in the Installation & Commissioning Manual.

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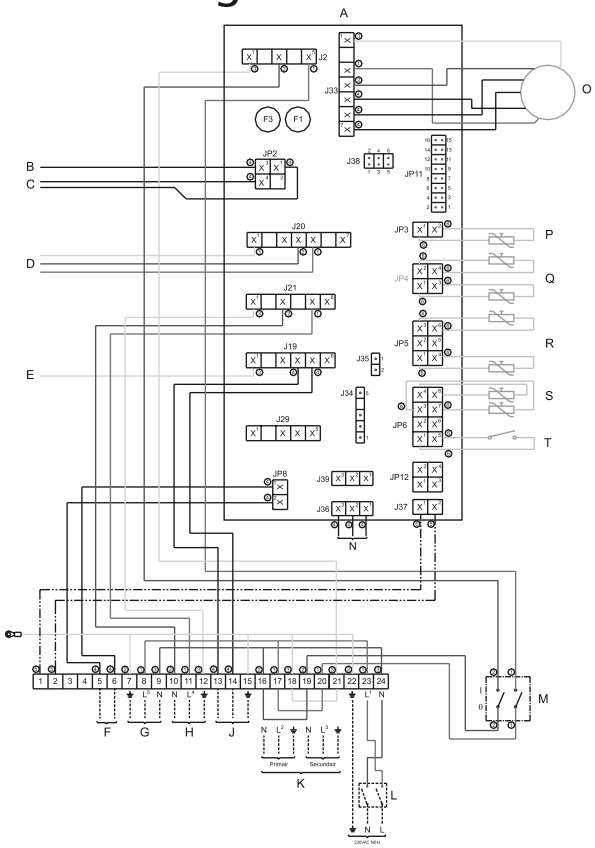
Cyclone BFC

Electrical diagram BFC 28-60



TERMINAL STRIP CONNECTIONS

⏚ Earth
N Neutral
L1 Phase input of controller
L2 Phase input of isolating transformer (primary side)
L3 Phase output of isolating transformer (secondary side)
L4 Phase input of program-controlled pump
L5 Phase input of continuous pump

COMPONENTS

A Controller
B Ionisation rod
C Glow igniter
D Gas control
E Burner earth connection
F Extra ON mode switch
G Continuous pump
H Program-controlled pump
J Extra error signal
K Isolating transformer
L Double-pole mains switch
M ON/OFF switch control
N Display/Flat cable
O Fan
P Temperature sensor (T2 - bottom of tank)
Q Dummy
R Temperature sensor (T1 - top of tank)
S Selection resistor
T Pressure switch

CONTROLLER CONNECTIONS

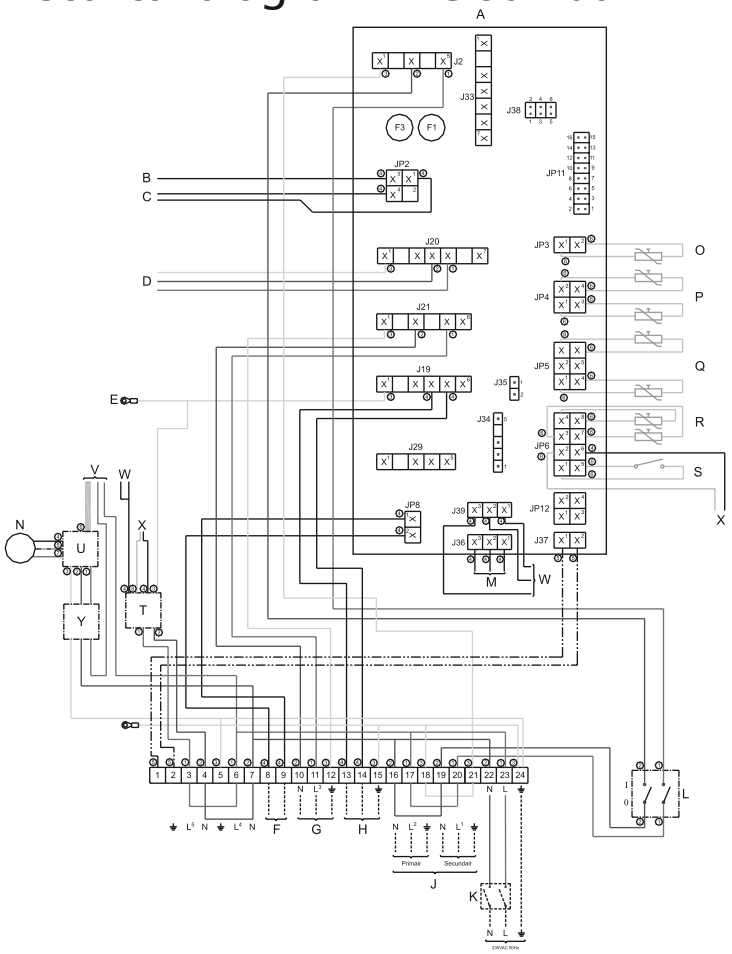
J1 Connector for display to controller
J2 Connector for power supply to controller
J19 Connector for extra error signal
J20 Connector for gas control
J21 Connector for program-controlled pump
J24 Connector for fan
JP2 Connector for ionisation rod and glow igniter
JP3 Connector for temperature sensor T2
JP4 Connector for dummy
JP5 Connector for temperature sensor T1
JP6 Connector for selection resistor and pressure switch
JP8 Connector for extra ON mode switch

F1 Fuse
F2 Fuse

Colour cables
①= brown
②= blue
③= yellow/green
④= black
⑤= white (flat cable)
⑥= grey/beige

Cyclone BFC

Electrical diagram BFC 80-100



TERMINAL STRIP CONNECTIONS

⏚ Earth
N Neutral
L Phase input of controller
L1 Phase output of isolating transformer (secundary side)
L2 Phase input of isolating transformer (primary side)
L3 Phase input of program-controlled pump
L4 Phase input of frequency controller
L5 Phase input of continuous pump

COMPONENTS

A Controller
B Ionisation rod
C Glow ignitor
D Gas control
E Burner earth connection
F External ON-mode switch
G Program-controlled pump
H External error-signal
J Isolating transformer
K Double-pole mains switch
L Controller 0/1 switch
M Display/Flat cable
N Fan
O Temperaturesensor (T2-bottom of tank)
P Dummy
Q Temperaturesensor (T1-top of tank)
R Selection resistor
S Pressure switch
T Potentiostat
U Frequency controller
V Argus-link interface
W Electric anodes
X Signaling for electric anodes
Y Mains choke and EMC filter

CONTROLLER CONNECTIONS

J2 Connector for power supply to controller
J19 Connector for external error-signal
J20 Connector for gas-control
J21 Connector for program controlled pump
J36 Connector for display to controller
J39 Connector for fan controlled signal
JP2 Connector for ionisation rod and glow ignitor
JP3 Connector for temperature sensor T2
JP4 Connector for dummy
JP5 Connector for temperature sensor T1
JP6 Connector for selection resistor, pressure switch and anode signaling
JP8 Connector for extra ON-mode switch

F1 Fuse
F3 Fuse

Colour cables
①= brown
②= blue
③= yellow/green
④= black
⑤= white (flat cable)
⑥= grey/beige
⑦= red
⑧= green

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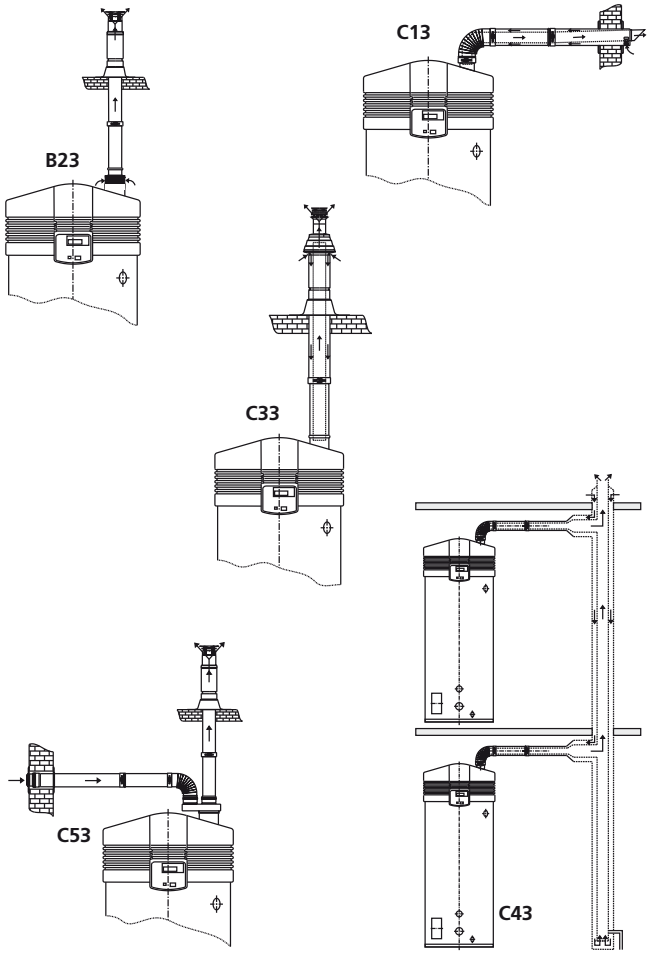
Installation options



A Cyclone BFC water heater should be installed according category B23, C13, C33, C43 or C53*.

	BFC 28	BFC 30	BFC 50	BFC 60	BFC 80	BFC 100
Concentric						
Diameter (mm)	80/125	100/150	100/150	100/150	130/200	130/200
Max. length (m)	40	40	40	15	15	15
Max. 45/90° bends	7	7	7	4	3	3
Parallel (standard diameter)						
Diameter (mm)	80	100	100	100	130	130
Max. length (m)	25	80	45	25	115	60
$L_{equivalent}$/bend 90° (m)	3,9	4,6	4,6	4,6	2,4	2,4
$L_{equivalent}$/bend 45° (m)	1,1	1,2	1,2	1,2	1,4	1,4
Parallel (larger diameter for more length)						
Diameter (mm)	100	130	130	130	150	150
Max. length (m)	100	100	100	100	100	100
$L_{equivalent}$/bend 90° (m)	4,6	2,4	2,4	2,4	2,6	2,6
$L_{equivalent}$/bend 45° (m)	1,2	1,4	1,4	1,4	1,6	1,6

* All Cyclone BFC are also approved for installations where the unit is supplied without venting materials (C63).

Concentric flues

It is **not** permitted to use more than the specified number of bends, even when the duct is shorter than the maximum length. A 45° bend is equivalent to a 90° bend.

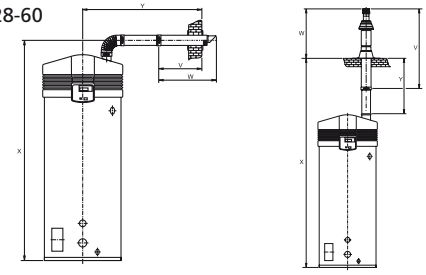
Parallel flues

- The maximum permissible length should be reduced by the equivalent length of each bend. (Note: for a parallel installation this means that 3 changes in direction amount to 6 bends (3 in the supply duct and 3 in the flue).
- The maximum length also applies if a parallel installation has different supply and flue duct lengths (B23, C53).
- Combined flues (C43) shall be fitted with a condensate drain.

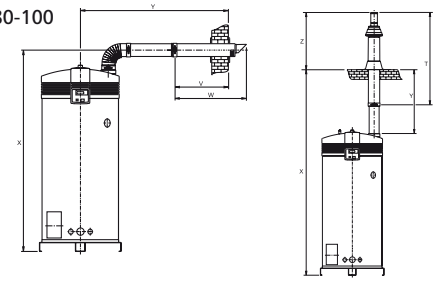
Note: horizontal flue runs must be installed with a fall of at least 5 mm per metre.

Minimum space requirements

BFC 28-60



BFC 80-100



	BFC 28 Ø80/125	BFC 30 Ø100/150	BFC 50 Ø100/150	BFC 60 Ø100/150	BFC 80 Ø130/200	BFC 100 Ø130/200
Minimal space for wall duct (mm)						
V	550	550	550	550	640	640
W	725	790	790	790	940	940
X	1535	2075	2075	2075	2230	2230
Y	1460	1480	1480	1480	1620	1620
Y *	1010	1030	1030	1030	1170	1170
Minimal space for roof duct (mm)						
V	1305	1500	1500	1500	1730	1730
W	680	1035	1035	1035	1120	1120
X	2965	3325	3325	3325	3620	3620
X **	2015	2375	2375	2375	2670	2670
Y	1575	1415	1415	1415	1560	1560
Y **	625	465	465	465	610	610

For the parts numbers of components and flue gas ducts, etc. please refer to the “Maintenance and accessories” chapter.

* Distance without concentric pipe between bend and wall duct.
** Distance without concentric pipe between appliance and roof duct.

Data subject to change INT/1108/BFC/04
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